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PATENT APPLICATION OF
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ENTITLED
THEFT PREVENTION DEVICE FOR AUTOMOTIVE
VEHICLE SERVICE CENTERS

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THEFT PREVENTION DEVICE FOR AUTOMOTIVE VEHICLE SERVICE CENTERS

BACKGROUND OF THE INVENTION

The present invention relates to portable tools
5 of the type used in automotive vehicle service
centers. More specifically, the present invention
relates to a theft prevention device used to prevent
theft of portable tools from the automotive vehicle
service centers.

10 Portable tools in automotive service centers
have a variety of applications. Some portable tools
can be used to test various components of an
automobile such that problems associated with the
automobile can be diagnosed. For example, storage
15 batteries used in automotive vehicles, both
electrical vehicles and vehicles with internal
combustion engines, as well as power supplies such as
backup power systems are often tested in an
automotive service center. It is desirable to measure
20 the condition of such storage batteries with a
portable battery tester. For example, it can be
useful to determine the amount of charge a storage
battery can hold (i.e. the capacity of the battery)
or the state of health of a storage battery.

25 A number of battery testing techniques are known
in the art. These techniques include measuring the
specific gravity of acid contained in a storage
battery. Measuring a battery voltage and performing a
load test on a battery in which a large load is

placed on the battery and the response observed. More recently, a technique has been pioneered by Dr. Keith S. Champlin and Midtronics, Inc. of Willowbrook, Illinois for testing storage batteries by measuring
5 the conductance of the batteries. This technique is described in a number of United State patents, for example, 3,873,911, issued March 25, 1975, to Champlin, entitled ELECTRONIC BATTERY TESTING DEVICE; U.S. Patent No. 3,909,708, issued September 30, 1975,
10 to Champlin, entitled ELECTRONIC BATTERY TESTING DEVICE; U.S. Patent No. 4,816,768, issued March 28, 1989, to Champlin, entitled ELECTRONIC BATTERY TESTING DEVICE; U.S. Patent No. 4,825,170, issued April 25, 1989, to Champlin, entitled ELECTRONIC BATTERY TESTING
15 DEVICE WITH AUTOMATIC VOLTAGE SCALING; U.S. Patent No. 4,881,038, issued November 14, 1989, to Champlin, entitled ELECTRONIC BATTERY TESTING DEVICE WITH AUTOMATIC VOLTAGE SCALING TO DETERMINE DYNAMIC CONDUCTANCE; U.S. Patent No. 4,912,416, issued March
20 27, 1990, to Champlin, entitled ELECTRONIC BATTERY TESTING DEVICE WITH STATE-OF-CHARGE COMPENSATION; U.S. Patent No. 5,140,269, issued August 18, 1992, to Champlin, entitled ELECTRONIC TESTER FOR ASSESSING BATTERY/CELL CAPACITY; U.S. Patent No. 5,343,380,
25 issued August 30, 1994, entitled METHOD AND APPARATUS FOR SUPPRESSING TIME VARYING SIGNALS IN BATTERIES UNDERGOING CHARGING OR DISCHARGING; U.S. Patent No. 5,572,136, issued November 5, 1996, entitled ELECTRONIC BATTERY TESTER WITH AUTOMATIC COMPENSATION FOR LOW

STATE-OF-CHARGE; U.S. Patent No. 5,574,355, issued November 12, 1996, entitled METHOD AND APPARATUS FOR DETECTION AND CONTROL OF THERMAL RUNAWAY IN A BATTERY UNDER CHARGE; U.S. Patent No. 5,585,416, issued
5 December 10, 1996, entitled APPARATUS AND METHOD FOR STEP-CHARGING BATTERIES TO OPTIMIZE CHARGE ACCEPTANCE; U.S. Patent No. 5,585,728, issued December 17, 1996, entitled ELECTRONIC BATTERY TESTER WITH AUTOMATIC COMPENSATION FOR LOW STATE-OF-CHARGE; U.S. Patent No.
10 5,589,757, issued December 31, 1996, entitled APPARATUS AND METHOD FOR STEP-CHARGING BATTERIES TO OPTIMIZE CHARGE ACCEPTANCE; U.S. Patent No. 5,592,093, issued January 7, 1997, entitled ELECTRONIC BATTERY TESTING DEVICE LOOSE TERMINAL CONNECTION DETECTION VIA A
15 COMPARISON CIRCUIT; U.S. Patent No. 5,598,098, issued January 28, 1997, entitled ELECTRONIC BATTERY TESTER WITH VERY HIGH NOISE IMMUNITY; U.S. Patent No. 5,656,920, issued August 12, 1997, entitled METHOD FOR OPTIMIZING THE CHARGING LEAD-ACID BATTERIES AND AN
20 INTERACTIVE CHARGER; U.S. Patent No. 5,757,192, issued May 26, 1998, entitled METHOD AND APPARATUS FOR DETECTING A BAD CELL IN A STORAGE BATTERY; U.S. Patent No. 5,821,756, issued October 13, 1998, entitled ELECTRONIC BATTERY TESTER WITH TAILORED COMPENSATION
25 FOR LOW STATE-OF-CHARGE; U.S. Patent No. 5,831,435, issued November 3, 1998, entitled BATTERY TESTER FOR JIS STANDARD; U.S. Patent No. 5,914,605, issued June 22, 1999, entitled ELECTRONIC BATTERY TESTER; U.S. Patent No. 5,945,829, issued August 31, 1999, entitled

MIDPOINT BATTERY MONITORING; U.S. Patent No. 6,002,238,
issued December 14, 1999, entitled METHOD AND APPARATUS
FOR MEASURING COMPLEX IMPEDANCE OF CELLS AND BATTERIES;
U.S. Patent No. 6,037,751, issued March 14, 2000,
5 entitled APPARATUS FOR CHARGING BATTERIES; U.S. Patent
No. 6,037,777, issued March 14, 2000, entitled METHOD
AND APPARATUS FOR DETERMINING BATTERY PROPERTIES FROM
COMPLEX IMPEDANCE/ADMITTANCE; U.S. Patent No.
6,051,976, issued April 18, 2000, entitled METHOD AND
10 APPARATUS FOR AUDITING A BATTERY TEST; U.S. Patent No.
6,081,098, issued June 27, 2000, entitled METHOD AND
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15 6,104,167, issued August 15, 2000, entitled METHOD AND
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6,137,269, issued October 24, 2000, entitled METHOD AND
APPARATUS FOR ELECTRONICALLY EVALUATING THE INTERNAL
TEMPERATURE OF AN ELECTROCHEMICAL CELL OR BATTERY; U.S.
20 Patent No. 6,163,156, issued December 19, 2000,
entitled ELECTRICAL CONNECTION FOR ELECTRONIC BATTERY
TESTER; U.S. Patent No. 6,172,483, issued January 9,
2001, entitled METHOD AND APPARATUS FOR MEASURING
COMPLEX IMPEDANCE OF CELL AND BATTERIES; U.S. Patent
25 No. 6,172,505, issued January 9, 2001, entitled
ELECTRONIC BATTERY TESTER; U.S. Patent No. 6,222,369,
issued April 24, 2001, entitled METHOD AND APPARATUS
FOR DETERMINING BATTERY PROPERTIES FROM COMPLEX
IMPEDANCE/ADMITTANCE; U.S. Patent No. 6,225,808, issued

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BATTERY TESTER; U.S. Patent No. 6,249,124, issued June
19, 2001, entitled ELECTRONIC BATTERY TESTER WITH
INTERNAL BATTERY; U.S. Patent No. 6,259,254, issued
5 July 10, 2001, entitled APPARATUS AND METHOD FOR
CARRYING OUT DIAGNOSTIC TESTS ON BATTERIES AND FOR
RAPIDLY CHARGING BATTERIES; U.S. Patent No. 6,262,563,
issued July 17, 2001, entitled METHOD AND APPARATUS FOR
MEASURING COMPLEX ADMITTANCE OF CELLS AND BATTERIES;
10 U.S. Patent No. 6,294,896, issued September 25, 2001;
entitled METHOD AND APPARATUS FOR MEASURING COMPLEX
SELF-IMMITANCE OF A GENERAL ELECTRICAL ELEMENT; U.S.
Patent No. 6,294,897, issued September 25, 2001,
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15 EVALUATING THE INTERNAL TEMPERATURE OF AN
ELECTROCHEMICAL CELL OR BATTERY; U.S. Patent No.
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FOR CALIBRATING ELECTRONIC BATTERY TESTER; U.S. Patent
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20 ELECTRONIC BATTERY TESTER; U.S. Patent No. 6,313,607,
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OR BATTERY; U.S. Patent No. 6,313,608, issued November
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25 BATTERY; U.S. Patent No. 6,316,914, issued November 13,
2001, entitled TESTING PARALLEL STRINGS OF STORAGE
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27, 2001, entitled ELECTRONIC BATTERY TESTER; U.S.
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entitled METHOD AND APPARATUS FOR CHARGING A BATTERY;
U.S. Patent No. 6,331,762, issued December 18, 2001,
entitled ENERGY MANAGEMENT SYSTEM FOR AUTOMOTIVE
VEHICLE; U.S. Patent No. 6,332,113, issued December 18,
5 2001, entitled ELECTRONIC BATTERY TESTER; U.S. Patent
No. 6,351,102, issued February 26, 2002, entitled
AUTOMOTIVE BATTERY CHARGING SYSTEM TESTER; U.S. Patent
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10 issued March 26, 2002, entitled ALTERNATOR DIAGNOSTIC
SYSTEM, U.S. Patent No. 6,392,414, issued May 21, 2002,
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15 OTHER ELECTRICAL ELEMENTS; U.S. Patent No. 6,424,158,
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20 FOR TESTING RECHARGEABLE ENERGY STORAGE BATTERIES; U.S.
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TESTER; U.S. Patent No. 6,466,026, issued October 15,
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MEASURING AC IMMITTANCE OF CELLS AND BATTERIES; U.S.

Patent No. 6,534,993, issued March 18, 2003, entitled
ELECTRONIC BATTERY TESTER; U.S. Patent No. 6,544,078,
issued April 8, 2003, entitled BATTERY CLAMP WITH
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5 issued April 29, 2003, entitled ELECTRONIC BATTERY
TESTER; U.S. Patent No. 6,566,883, issued May 20, 2003,
entitled ELECTRONIC BATTERY TESTER; U.S. Patent No.
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10 22, 2003, entitled METHOD OF DISTRIBUTING JUMP-START
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15 FOR DETERMINING BATTERY PROPERTIES FROM COMPLEX
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May 21, 2001, entitled METHOD AND APPARATUS FOR TESTING
CELLS AND BATTERIES EMBEDDED IN SERIES/PARALLEL
SYSTEMS; U.S. Serial No. 09/960,117, filed September
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Serial No. 09/880,473, filed June 13, 2001; entitled
BATTERY TEST MODULE; U.S. Serial No. 09/940,684, filed
25 August 27, 2001, entitled METHOD AND APPARATUS FOR
EVALUATING STORED CHARGE IN AN ELECTROCHEMICAL CELL OR
BATTERY; U.S. Serial No. 60/330,441, filed October 17,
2001, entitled ELECTRONIC BATTERY TESTER WITH RELATIVE
TEST OUTPUT; U.S. Serial No. 60/348,479, filed October

29, 2001, entitled CONCEPT FOR TESTING HIGH POWER VRLA
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AUTOMOTIVE VEHICLE; U.S. Serial No. 09/993,468, filed
5 November 14, 2001, entitled KELVIN CONNECTOR FOR A
BATTERY POST; U.S. Serial No. 09/992,350, filed
November 26, 2001, entitled ELECTRONIC BATTERY TESTER,
U.S. Serial No. 60/341,902, filed December 19, 2001,
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10 10/042,451, filed January 8, 2002, entitled BATTERY
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20 APPARATUS FOR AUDITING A BATTERY TEST; U.S. Serial No.
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10/112,105, filed March 28, 2002, entitled CHARGE
CONTROL SYSTEM FOR A VEHICLE BATTERY; U.S. Serial No.
25 10/112,998, filed March 29, 2002, entitled BATTERY
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INCREASING THE LIFE OF A STORAGE BATTERY; U.S. Serial
5 No. 10/177,635, filed June 21, 2002, entitled BATTERY
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10 AUTOMOTIVE VEHICLE ELECTRICAL SYSTEM DIAGNOSTIC DEVICE;
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15 Serial No. 10/246,439, filed September 18, 2002,
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U.S. Serial No. 60/415,399, filed October 2, 2002,
entitled QUERY BASED ELECTRONIC BATTERY TESTER; and
U.S. Serial No. 10/263,473, filed October 2, 2002,
20 entitled ELECTRONIC BATTERY TESTER WITH RELATIVE TEST
OUTPUT; U.S. Serial No. 60/415,796, filed October 3,
2002, entitled QUERY BASED ELECTRONIC BATTERY TESTER;
U.S. Serial No. 10/271,342, filed October 15, 2002,
entitled IN-VEHICLE BATTERY MONITOR; U.S. Serial No.
25 10/270,777, filed October 15, 2002, entitled
PROGRAMMABLE CURRENT EXCITER FOR MEASURING AC
IMMITTANCE OF CELLS AND BATTERIES; U.S. Serial No.
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TEST MODULE; U.S. Serial No. 10/310,490, filed December

5, 2002, entitled ELECTRONIC BATTERY TESTER; U.S. Serial No. 10/310,385, filed December 5, 2002, entitled BATTERY TEST MODULE, U.S. Serial No. 60/437,255, filed December 31, 2002, entitled REMAINING TIME PREDICTIONS, 5 U.S. Serial No. 60/437,224, filed December 31, 2002, entitled DISCHARGE VOLTAGE PREDICTIONS, U.S. Serial No. 10/349,053, filed January 22, 2003, entitled APPARATUS AND METHOD FOR PROTECTING A BATTERY FROM OVERDISCHARGE, U.S. Serial No. 10/388,855, filed March 14, 2003, 10 entitled ELECTRONIC BATTERY TESTER WITH BATTERY FAILURE TEMPERATURE DETERMINATION, U.S. Serial No. 10/396,550, filed March 25, 2003, entitled ELECTRONIC BATTERY TESTER, U.S. Serial No. 60/467,872, filed May 5, 2003, entitled METHOD FOR DETERMINING BATTERY STATE OF 15 CHARGE, U.S. Serial No. 60/477,082, filed June 9, 2003, entitled ALTERNATOR TESTER, U.S. Serial No. 10/460,749, filed June 12, 2003, entitled MODULAR BATTERY TESTER FOR SCAN TOOL, U.S. Serial No. 10/462,323, filed June 16, 2003, entitled ELECTRONIC 20 BATTERY TESTER HAVING A USER INTERFACE TO CONFIGURE A PRINTER, U.S. Serial No. 10/601,608, filed June 23, 2003, entitled CABLE FOR ELECTRONIC BATTERY TESTER, U.S. Serial No. 10/601,432, filed June 23, 2003, entitled BATTERY TESTER CABLE WITH MEMORY; U.S. Serial 25 No. 60/490,153, filed July 25, 2003, entitled SHUNT CONNECTION TO A PCB FOR AN ENERGY MANAGEMENT SYSTEM EMPLOYED IN AN AUTOMOTIVE VEHICLE, U.S. Serial No. 10/653,342, filed September 2, 2003, entitled ELECTRONIC BATTERY TESTER CONFIGURED TO PREDICT A LOAD

TEST RESULT, U.S. Serial No. 10/654,098, filed
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ADJUSTED BASED UPON BATTERY TEMPERATURE AND THE STATE
OF DISCHARGE OF THE BATTERY, U.S. Serial No.
5 10/656,526, filed September 5, 2003, entitled METHOD
AND APPARATUS FOR MEASURING A PARAMETER OF A VEHICLE
ELECTRICAL SYSTEM, U.S. Serial No. 10/656,538, filed
September 5, 2003, entitled ALTERNATOR TESTER WITH
ENCODED OUTPUT, which are incorporated herein in their
10 entirety.

The theft of portable devices, especially
portable electronic devices, continues to be a
widespread problem. Portable tools used by
technicians in automotive vehicle service centers are
15 generally mobile as well as expensive. The service
center environment is often chaotic and includes a
large quantity of people arriving and departing.
Portable tools can easily be stolen without notice of
those managing or working at the center.

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SUMMARY OF THE INVENTION

An apparatus and method for preventing theft in
automotive vehicle service centers includes a
transmitter configured to transmit a wireless
25 security signal which defines a perimeter. At least
one portable tool having a receiver configured to
receive the transmitted security signal. Security
circuitry is actuated if the tool is outside and/or
near the perimeter defined by the security signal.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1-1 is a simplified block diagram of a theft prevention device prior to a theft in accordance with an embodiment of the present invention.

FIG. 1-2 is a simplified block diagram of the theft prevention device of FIG. 1-1 after the theft has occurred in accordance with an embodiment of the present invention.

FIG. 2-1 is a simplified block diagram of a theft prevention device prior to a theft in accordance with an embodiment of the present invention.

FIG. 2-2 is a simplified block diagram of the theft prevention device of FIG. 2-1 after the theft has occurred in accordance with an embodiment of the present invention.

FIG. 3 is a simplified block diagram of an automotive vehicle service center in accordance with an embodiment of the present invention.

FIG. 4 is a simplified block diagram of an automotive vehicle service center in accordance with an embodiment of the present invention.

FIG. 5 is a simplified block diagram of an electronic battery tester in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1-1 is a simplified block diagram of theft prevention device 100 prior to a theft in accordance with an embodiment of the present invention. Device 100 includes transmitter 104 configured to transmit a wireless security signal 106 that defines a perimeter. Device 100 also includes a receiver 108 embedded in portable tool 102 and operably coupled to security circuitry 110. Security signal 106 can be encoded with a key such that secure communication can take place between transmitter 104 and portable tool 102. The key can be randomly changeable to ensure secure communication. Security signal 106 can also transmit other information besides defining a perimeter. Examples of other information include software updates for the portable tool, messages for the operator and time updates.

Receiver 108 is configured to receive the transmitted security signal 106. If portable tool 102 remains located within the perimeter defined by the wireless security signal, then proper use and/or storage of portable tool 102 is being practiced within an automotive vehicle service center. If, however, portable tool 102 is carried outside the perimeter, a theft has occurred. For example, non-receipt of security signal 106 by receiver 108 can indicate that portable tool 102 is outside of the perimeter. In another example, receipt of security signal 106 having a signal strength less than a

predetermined minimum signal strength can indicate that portable tool 102 is outside the perimeter. In FIG. 1-1, transmitter 104 is in communication with receiver 108 and the strength of security signal 106 is greater than the predetermined minimum signal strength. Therefore, portable tool 102 is located within the perimeter defined by security signal 106 and is in proper use.

FIG. 1-2 is a simplified block diagram of theft prevention device 100 of FIG. 1-1 after the theft has occurred in accordance with an embodiment of the present invention. Portable tool 102 includes an output 112 operably coupled to security circuitry 110 and tool transmitter 114 operably coupled to security circuitry 110. Portable tool 102 also includes an internal power source 140 configured to supply power to security circuitry 110 such that portable tool can receive security signal 106, output the continuous audible noise and transmit theft signal 116. As illustrated in FIG. 1-2, transmitter 104 has either lost communication with receiver 108 or security signal 106 is less than the predetermined minimum signal strength. Therefore, a theft has occurred because portable tool 102 has been carried outside of the perimeter defined by security signal 106.

When a theft occurs, security circuitry 110 is configured to disable portable tool 102 causing the tool to become inoperable. For example, security circuitry 110 can disable portable tool 102 after the

portable tool has been outside of the perimeter for a predetermined period of time. Waiting the predetermined period of time prevents portable tool 102 from disabling if there was a temporary
5 interruption in security signal 106. In addition, security circuitry 110 instructs output 112 to emit a continuous audible noise. This continuous audible noise will alert service center employees that portable tool 102 has been stolen and alert others
10 outside of the service center. Furthermore, when portable tool 102 is carried outside of the perimeter defined by security signal 106, security circuitry 110 instructs tool transmitter 114 to transmit theft signal 116. It should be noted that portable tool 102
15 can also be reset and/or overridden with a hardware or software key such that theft protection device 100 is disabled.

As illustrated in FIG. 1-2, device 100 further includes processing circuitry 118 operably coupled to
20 transmitter 104 and external receiver 120 operably coupled to processing circuitry 118. External receiver 120 is configured to receive the transmitted theft signal 116. When external receiver 120 receives the transmitted theft signal 116, processing
25 circuitry 118 is configured to output an audible alarm. In addition, processing circuitry 118 records in memory 122 information related to theft signal 116 for later user retrieval. For example, processing circuitry 118 can record a date and time when

portable tool 102 was stolen. Processing circuitry 118 can also record a serial number or identification number related to the particular portable tool 102 stolen based on the received theft signal 116.

5 Both security signal 104 and theft signal 116 can include a variety of signals. For example, transmitter 104 and tool transmitter 114 can transmit a diffused infrared signal while receiver 108 and external receiver 120 can be configured to receive a
10 diffused infrared signal. Diffused infrared signals utilize the walls and ceilings of a room to bounce infrared signals between a transmitter and a receiver. Thus, people walking about the room as well as fixed obstructions will not interfere with
15 sustained infrared communications. However, transmitter 104, external receiver 120 and portable tool 102 must all be located in the same room because infrared communication can not penetrate obstructions, such as walls. In another example,
20 transmitter 104 and tool transmitter 114 can transmit a radio frequency (RF) signal while receiver 108 and external receiver 120 can be configured to receive a RF signal. In this example, transmitter 104, external receiver 120 and portable tool 102 can all be located
25 in different rooms because RF signals can easily penetrate walls and other obstructions. Two common standards for RF communication include the Bluetooth protocol and the 802.11(b) protocol. The Bluetooth protocol is cost-effective and easy to implement.

However, the distance the Bluetooth signal covers is less than the distance covered by the 802.11(b) signal.

FIG. 2-1 is a simplified block diagram of theft prevention device 200 prior to a theft in accordance with an embodiment of the present invention. Device 200 includes transmitter 204 configured to transmit a wireless security signal 206 that defines a perimeter. Device 200 also includes a receiver 208
5 embedded in portable tool 202 and operably coupled to security circuitry 210. Security signal 206 can be encoded with a key such that secure communication can take place between transmitter 204 and portable tool 202. The key can be randomly changeable to ensure
10 secure communication. Security signal 206 can also transmit other information besides defining a perimeter. Examples of other information include software updates for the portable tool, messages for the operator and time updates.

Receiver 208 is configured to receive the transmitted security signal 206. If portable tool 202 remains located outside the perimeter, then proper use and /or storage of portable tool 202 is being practiced within the automotive service center. If,
20 however, portable tool 202 at least passes through the perimeter, a theft has occurred. For example, receipt of security signal 106 can indicate that portable tool 202 is within the perimeter defined by the security signal. In another example, receipt of
25

security signal 106 having a signal strength greater than a predetermined minimum signal strength can indicate that portable tool 202 is located within the perimeter. In FIG. 2-1, transmitter 204 is not in
5 communication with receiver 208 or security signal 206 has a signal strength less than the predetermined minimum signal strength. Therefore, portable tool 102 is located outside the perimeter defined by security signal 206 and is in proper use.

10 FIG. 2-2 is a simplified block diagram of theft prevention device 200 of FIG. 2-1 after a theft has occurred in accordance with an embodiment of the present invention. Portable tool 202 includes an output 212 operably coupled to security circuitry 210
15 as well as tool transmitter 214 operably coupled to security circuitry 210. Portable tool 202 also includes an internal power source 240 configured to supply power to security circuitry 210 such that portable tool can receive security signal 206, output
20 the continuous audible noise and transmit theft signal 216. As illustrated in FIG. 2-2, transmitter 204 is in communication with receiver 208 or security signal 206 has a signal strength greater than the predetermined minimum signal strength. Therefore,
25 portable tool 202 has at least partially passed through the perimeter defined by security signal 206 and a theft has occurred.

If a theft has occurred, security circuitry 210 is configured to disable portable tool 202 causing

the tool to become inoperable. For example, security circuitry 110 can disable portable tool 102 after the portable tool has been outside of the perimeter for a predetermined period of time. Waiting the
5 predetermined period of time prevents portable tool 102 from disabling if there was a temporary interruption in security signal 106. In addition, security circuitry 210 instructs output 212 to emit a continuous audible noise. This continuous audible
10 noise will alert service center employees that portable tool 202 has been stolen and alert others outside of the service center. Furthermore, when portable tool 202 at least partially passes through the perimeter defined by security signal 206,
15 security circuitry 210 instructs tool transmitter 214 to transmit theft signal 216. It should be noted that portable tool 202 can also be reset and/or overridden with a hardware or software key such that theft protection device 200 is disabled.

20 As illustrated in FIG. 2-2, device 200 further includes processing circuitry 218 operably coupled to transmitter 204 and external receiver 220 operably coupled to processing circuitry 218. External receiver 220 is configured to receive the transmitted
25 theft signal 216. If external receiver 220 receives the transmitted theft signal 216, then processing circuitry 218 is configured to output an audible alarm. In addition, processing circuitry 218 records in memory 222 information related to theft signal 216

for later user retrieval. For example, processing circuitry 218 can record a date and time when portable tool 202 was stolen. In addition, theft signal 216 can include information related to
5 identification of the particular portable tool 202 based on theft signal 216. Thus, processing circuitry 218 can also record a serial number or identification number related to the particular portable tool 202 stolen.

10 Both security signal 204 and theft signal 216 can include a variety of signals. For example, transmitter 204 and tool transmitter 214 can transmit a diffused infrared signal while receiver 208 and external receiver 220 can be configured to receive a
15 diffused infrared signal. In another example, transmitter 204 can transmit a direct infrared signal (or beam of infrared light) and receiver 208 can be configured to receive the direct infrared signal. In another example, transmitter 204 and tool transmitter
20 214 can transmit a radio frequency (RF) signal while receiver 208 and external receiver 220 can be configured to receive a RF signal. Two common standards for RF communication include the Bluetooth protocol and the 802.11(b) protocol. In yet another
25 example, receiver 208, tool transmitter 214 and security circuitry 210 can include a radio frequency identification (RFID) tag, while external receiver 220 and transmitter 204 can include a RFID reader. In this example, the RFID tag at least partially passes

through the perimeter defined by security signal 206. The RFID tag detects security signal 206 and disables portable tool 202 from operation as well as instructs output 212 to emit a continuous audible noise as
5 described above. After the RFID reader transmits RF signals to activate the tag, the RFID reader decodes the data encoded in the tag's security circuitry. The decoded data is passed to processing circuitry 218 for identification and reporting as well as causes
10 processing circuitry to sound an audible alarm as discussed above.

FIG. 3 is a simplified block diagram of automotive service center 324. Automotive service center 324 includes repair area 325 as well as inner
15 office space 326. Service center 324 also includes a plurality of exits and entrances 328 around outer walls 329 of center 324. As illustrated in FIG. 3, transmitter 304 is located in repair area 325 and is transmitting a security signal (FIGS. 1-1 and 1-2).
20 The security signal defines a perimeter represented by dashed line 330. A plurality of portable tools 302 are located about repair area 325. Each portable tool 302 receives the security signal with an receiver (FIGS. 1-1 and 1-2). If a person were to pick up at
25 least one of the plurality of tools 302 and carry tool 302 outside of dashed line 330, then the security circuitry (FIGS. 1-1 and 1-2) of that particular portable tool 302 would disable the tool. Therefore, portable tool 302 is rendered inoperable.

In addition, the security circuitry instructs an output (FIGS. 1-1 and 1-2) to emit a continuous audible noise.

Furthermore, when a person carries at least one
5 portable tool 302 outside of the dashed line, the security circuitry instructs a tool transmitter (FIGS. 1-1 and 1-2) embedded within portable tool 302 to transmit a theft signal (FIGS. 1-1 and 1-2). An external receiver 320 located within inner office
10 space 326 and operably coupled to processing circuitry 318 is configured to receive the transmitted theft signal. Upon receipt of the theft signal by external receiver 320, processing circuitry 318 records information related to the theft signal
15 as well as outputs an audible alarm. In accordance with FIG. 3, the security signal can be a diffused infrared signal or a RF signal. The theft signal can be a RF signal but not an infrared signal since infrared signal can not penetrate the walls of inner
20 office space 326. Those skilled in the art will recognize that the theft signal could be a diffused infrared signal if the external receiver was located in repair area 325. Communication between external receiver 320 and processing circuitry 318 and between
25 the transmitter 304 and processing circuitry can be any type of cable connection as well as any type of wireless connection.

FIG. 4 is a simplified block diagram of automotive service center 424. Automotive service

center 424 includes repair area 425 as well as inner office space 426. Service center 424 also includes a plurality of exits and entrances 428 around the outer walls 429 of center 424. FIG. 4 also illustrates a plurality of transmitters 404. Each transmitter 404 is located within each exit and entrance 428. Each transmitter 404 is configured to transmit a security signal (FIGS. 2-1 and 2-2). Each security signal defines a perimeter represented by dashed lines 430.

10 A plurality of portable tools 402 are located about repair area 425. Each portable tool 402 is configured to receive the security signal with a receiver (FIGS. 2-1 and 2-2). If a person were to pick up at least one of the plurality of tools 402 and carry it

15 through an entrance or exit 428, then tool 402 would at least pass partially through one of the perimeters illustrated by dashed line 430. Upon passing at least partially through one perimeter, the security circuitry (FIGS. 2-1 and 2-2) of that particular

20 portable tool 402 would disable the tool. Therefore, portable tool 402 is rendered inoperable. In addition, the security circuitry instructs an output (FIGS. 2-1 and 2-2) to emit a continuous audible noise.

25 Furthermore, if a person carries at least one portable tool 402 at least partially through an entrance or exit 428, the security circuitry instructs a tool transmitter (FIGS. 2-1 and 2-2) embedded within portable tool 402 to transmit a theft

signal (FIGS. 2-1 and 2-2). An external receiver 420 located within inner office space 426 and operably coupled to processing circuitry 418 is configured to receive the transmitted theft signal. Upon receipt of the theft signal by external receiver 420, processing circuitry 418 records information related to the theft signal as well as outputs an audible alarm. In accordance with FIG. 4, the security signal can be a diffused infrared signals or a RF signal. The theft signal can be a RF signal but not an infrared signal since an infrared signal can not penetrate the walls of inner office space 426. Those skilled in the art will recognize that the theft signal could be a diffused infrared signal if the external receiver was located in repair area 405. Communication between external receiver 420 and processing circuitry 418 and between the transmitter 404 and the processing circuitry can be any type of cable connection as well as a type of wireless connection.

FIG. 5 is a simplified block diagram of an example electronic battery tester 502 with which embodiments of the present invention are useful. Battery tester 502 is a type of portable tool which couples to a battery (not shown) via connectors 532. For example, connectors 532 may provide Kelvin connections to a battery. Note that FIG. 5 is illustrative of a specific type of battery tester which measures dynamic parameters. However, in one aspect, the present invention is applicable to any

type of battery tester including those which do not use dynamic parameters. Other types of example testers include testers that conduct load tests, current based tests, voltage based tests, tests which
5 apply various conditions or observe various performance parameters of a battery, etc.

Battery tester 502 includes test circuitry 534. Test circuitry 534 contains processor 536, security circuitry 518 and other circuitry configured to
10 measure a dynamic parameter of a battery. As used herein, a dynamic parameter is one which is related to a signal having a time varying component. The signal can be either applied to or drawn from the battery.

Besides assisting in measuring dynamic and non-
15 dynamic parameters of the battery, processor 536 also controls the operation of other components, such as theft prevention components, within battery tester 502. Battery tester 502 also includes output 512, tester transmitter 514 and receiver 508. Processor
20 536 controls the operation of these theft prevention components as well as carries out different battery testing functions. Battery tester 502 also includes internal power source 540. Generally, processor 536 draws its power from the battery being tested when in
25 operation. However, battery tester 502 includes power source 540 such that processor 536 can control security circuitry 510, output 512, tester transmitter 514 and receiver 508 when battery tester 502 is not coupled to a battery being tested.

In some embodiments of the present invention, tool transmitter 514 is configured to transmit an infrared or RF signal and receiver 508 is configured to receive an infrared or RF signal. In this example, 5 the theft prevention components rely on an internal power source 540 in order to complete the theft prevention operations as described in FIGS. 1-4. In other embodiments of the present invention, tool transmitter 514, receiver 508 and security circuitry 10 510 include a RFID tag. In this example, the theft prevention components rely on a reader to supply power in order to complete the theft prevention operations. Thus, no internal power source is needed.

Although the present invention has been 15 described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.